RISK ASSESSMENT TOOLS IN CRIMINAL JUSTICE: IS THERE A NEED FOR SUCH TOOLS IN EUROPE AND WOULD THEIR USE COMPLY WITH EUROPEAN DATA PROTECTION LAW?

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ABSTRACT

The use of risk assessment tools for offender classification has a long history in the criminal justice system in the United States ('US'). These tools are used to inform courts' decisions at different stages of the criminal justice process. There is an ongoing and mature debate as to the role of risk assessment tools in the US criminal justice system. Some argue that these algorithms are racially biased and can lead to discriminatory decision making. Conversely, others argue that risk assessment tools could assist in the reform of the US criminal justice system, which has long suffered from racial injustice and mass incarceration. Notably, risk assessment tools are not used widely by judicial authorities in the member states of the Council of Europe and the European Union. Some European countries have introduced related pilot projects, while others have established scientific councils to examine the use of algorithms in the field of justice. This paper describes the actuarial risk assessment tools available in the US and the latest developments in this field (eg, the incorporation of machine learning in their functioning). This paper also examines whether the use of such tools could have added value in the European criminal justice field. Finally, this paper examines some of the legal issues that arise in relation to the use of such tools in Europe based on European data protection and privacy laws.

I INTRODUCTION

The use of risk assessment tools in offender classification has a long history in the criminal justice system of the United States ('US'). These tools are used to inform courts' decisions at different stages of the criminal justice process, from pretrial services to proceedings closely related to defendants' freedom. For example, these tools are used to assign bail amounts to suspects for court appearances after arrest, in parole decisions, in rulings related to probation and even to make decisions in sentencing proceedings in states such as Arizona, Colorado, Delaware, Indiana, Kentucky, Louisiana, Oklahoma, Virginia, Washington and Wisconsin.[1]

In the US, there is an ongoing and mature debate as to the role of risk assessment tools in the criminal justice system. Some argue that these algorithms are racially biased and lead to

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[1] Bureau of Justice Assistance (United States [US] Department of Justice), *Risk Assessment Landscape* (Webpage, 2019) <https://psrac.bja.ojp.gov/selection/landscape>.

discriminatory decision making.[2] Conversely, others argue that risk assessment tools could assist in the reform of the US criminal justice system, which has long suffered from racial injustice and mass incarceration.[3] Additionally, the judicial authorities in the US appear to have differing views on the use of risk assessment tools. Notably, in some rulings, judicial authorities have made positive comments about their implementation (eg, *J S v State*,[4] *Malenchik v State*[5] and *State v Loomis*[6]); however, in other rulings, judicial authorities have expressed negative views (e.g., *Cardwell v State*[7] and *Rhodes v State*[8]).

Risk assessment tools are not used by the judicial authorities in the member states of the Council of Europe and the European Union ('EU'). The Council of Europe's European Commission for the Efficiency of Justice ('CEPEJ') notes that pilot programs have been carried out in some member countries, such as France[9] and the United Kingdom ('UK'),[10] to explore the

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[2] Julia Angwin et al, 'Machine Bias', *Propublica* (Webpage, 2016) <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.

[3] Gideon's Promise et al, *Joint Statement: Pretrial Risk Assessment Instruments* (Webpage, 2019) <https://www.nacdl.org/getattachment/c80216bf-84e0-429d-9750-9e49f502913d/joint-statement-on-pretrial-risk-assessment-instruments-march-2019-.pdf>.

[4] 928 N.E.2d 576 (Ind. 2010). In *J S v State*, the Court ruled that Level of Service Inventory–Revised (LSI-R) scores could serve as appropriate supplemental considerations in a case and praised the added value of risk assessment tools in the criminal justice system. As the Court stated, 'the LSI-R score is an appropriate supplemental consideration in judicial sentencing proceedings. Such evidence-based assessment instruments can be significant sources of valuable information for judicial consideration in deciding whether to suspend all or part of a sentence, how to design a probation program for the offender, whether to assign an offender to alternative treatment facilities or programs, and other such corollary sentencing matters' (at 2). Moreover, the Court held that when a judge refuses to take into consideration the score of a risk assessment tool as a possible mitigating factor for the sentencing, such behaviour is not an abuse of discretion. Such scores are not considered aggravating or mitigating factors; rather, their role is to 'supplement and enhance a judge's evaluation, weighing, and application of the other sentencing evidence in the formulation of an individualized sentencing program appropriate for each defendant' (at 4).

[5] 928 NE2d 564 (Ind, 2010). In this case, the court concluded that 'trial courts are encouraged to employ evidence-based offender assessment instruments, including, where appropriate, the LSI-R ... as supplemental considerations in crafting a penal program tailored to each individual defendant' (at 12). Note: the LSI-R stands is a risk assessment tool widely used in the US See Section 2.

[6] 881 NW2d 749 (2016). In the famous case *State v Loomis*, the Court stated that Mr. Loomis 'failed to meet his burden of showing that the sentencing court actually relied on gender as a factor in sentencing' (at [86]) and it concluded that 'the use of the COMPAS risk assessment at sentencing did not violate Loomis' right to due process' (at [86]). Finally, the Court emphasised that it has been determined that 'COMPAS's use of gender promotes accuracy that ultimately inures to the benefit of the justice system including defendants' (at [86]). Note: COMPAS stands for Correctional Offender Management Profile for Alternative Sanctions. It is a risk assessment tool widely used in the US. See Section 2.

[7] 895 NE 2d 1219 (Ind. 2008). In *Cardwell v State*, the Supreme Court of Indiana made an important statement about the use of risk assessment tools in courts. The Court emphasised that a mechanical approach to sentencing raises more problems than it solves, while '[a]ny effort to force a sentence to result from some algorithm based on the number and definition of crimes and various consequences removes the ability of the trial judge to ameliorate the inevitable unfairness a mindless formula sometimes produces' (at 6). Thus, with this ruling, the Court made a strong point that constitutes 'an abuse of the judge's discretion to rely on scoring models to determine a sentence' (at 6).

[8] 896 NE2d 1193 (Ind Ct App 2008). In this case, the Court ruled that '[t]he use of a standardized scoring model, such as the LSI-R, undercuts the trial court's responsibility to craft an appropriate, individualized sentence. Relying upon a sum of numbers purportedly derived from objective data cannot serve as a substitute for an independent and thoughtful evaluation of the evidence presented for consideration' (at 4).

[9] At the initiative of the French Ministry of Justice, the Douai and Rennes appeal courts in France agreed to test predictive justice software on various litigation appeals in spring 2017 related to civil, social and commercial decisions of all French courts of appeal. The outcome of the experiment emphasised 'the absence of added value of the tested version of the software for the work of reflection and decision making of the magistrates. More significantly, software reasoning biases were revealed that led to aberrant or inappropriate results due to confusion between mere lexical occurrences of judicial reasoning and the causalities that had been decisive in the judges' reasoning' (CEPEJ, 2018, 42).

[10] The Harm Assessment Risk Tool (HART); See Section 2.

potential use of these applications, but have yet to be applied on a wider scale.[11] Additionally, special committees have been formed to examine the potential use of artificial intelligence ('AI') in the general field of the judiciary in countries such as the Netherlands[12] and Greece.[13] Finally, there is no tradition of the use of risk assessment tools by the judiciary in European countries; however, both the Council of Europe and the EU have been relying on legislation that is open to the use of profiling to examine the potential of this technology in the criminal justice field.[14]

This recent interest in the potential use of risk assessment tools in Europe paves the way for lessons to be drawn from the US where the literature on this subject is well developed. The supporters of risk assessment tools present this technology as the solution to the problems of racial injustice and mass incarceration that have severely affected the criminal justice and prison systems in the US.[15] However, given that the effectiveness of risk assessment tools in the field of criminal justice is still subject to debate by US courts and scientists, numerous questions arise. Does the use of such tools constitute a good practice that should be adopted by European criminal justice authorities? Do the problems of mass incarceration and racial injustice present challenges for Europe as they do for the US? If risk assessment tools were used in the field of European criminal justice, what legal risks would arise in relation to the provisions of the applicable European laws on data protection and privacy? This paper aims to address these three questions.

The methodology used in this paper is a doctrinal (black letter) analysis. In this paper, the reader will be confronted with the views and opinions put forth by prominent computer

[11] European Commission for the Efficiency of Justice (CEPEJ), *European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems* (Council of Europe, 2018) <https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c>.

[12] The East Brabant District Court, together with Tilburg Law School and the Jheronimus Academy of Data Science, appointed Professor Floris Bex as the special chair in Data Science in the Judiciary to perform pilot studies with artificial intelligence (AI) and automated decision making at the District Court; AlgorithmWatch, *Automating Society: Taking Stock of Automated Decision-Making in the EU* (Online Report, 2019) <https://algorithmwatch.org/wp-content/uploads/2019/01/Automating_Society_Report_2019.pdf>.

[13] In 2019, Greece established a scientific committee entrusted with the task to examine the impact of AI on the Greek judicial system; The Hellenic Ministry of Justice, Transparency, and Human Rights, *Decision on the Establishment of the Standing Scientific Committee Entrusted with the Task to Examine the Impact of Artificial Intelligence on the Greek Judicial System* (Online Report, 2019) <https://drive.google.com/file/d/1QKekHanvyWOebaCfGU7DN8w1TpUO_aHz/view>.

[14] European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe* (Report, 2018); Parliamentary Assembly ('PACE'), *Recommendation No. 2102 about Technological Convergence, Artificial Intelligence and Human Rights* (Web Page, 2017) <https://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=23726&lang=en>; PACE, *Motion for a Recommendation about Justice by Algorithm—The Role of Artificial Intelligence in Policing and Criminal Justice Systems* (Web Page, 26 September 2018) <http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=25062&lang=en>.

[15] Ben Green, 'Fair Risk Assessments: A Precarious Approach for Criminal Justice Reform' (Workshop Paper, 2018) <https://scholar.harvard.edu/bgreen/publications/%E2%80%9Cfair%E2%80%9D-risk-assessments-precarious-approach-criminal-justice-reform>.

science, legal and ethical scholars on a number of issues. The materials used include academic papers from computer science scholars based in the US and Europe, explanatory documents and guides issued by the manufacturers of risk assessment tools and the public bodies using the latter, primary legal sources, such as the applicable legal provisions and the related case law, secondary legal sources, such as academic papers by legal scholars, publications from the Council of Europe and the EU and academic publications by ethical scholars.

Before embarking on the main legal analysis/investigation of this piece, it is important to note that when references are made to risk assessment tools, the term AI is to be avoided, as this term encompasses a wide range of controversial ideas.[16] The terminology used throughout this paper will be as precise as possible to provide a detailed description of the technology involved.

II Technical Information about Risk Assessment Tools and Their Use in Criminal Justice

A *The Different Generations of Risk Assessment Tools*

As a cornerstone of the movement towards data-driven decision-making, risk assessment is used at different stages of the judicial process to assess an individual's risk of reoffending (or likelihood of complying with justice requirements) and to identify areas for intervention.[17] Before describing the history of risk assessment in the criminal justice field, it is important to closely examine the different factors used in the actuarial determination of risk. To begin with, the assessment is based on static factors and dynamic factors. Static factors are characteristics that cannot be changed; for example, the race of an individual. Conversely, dynamic factors are characteristics that can be changed either slowly or relatively quickly over time, such as family and marital status, employment and education level.[18] Taxman and Pattavina describe the different dynamic factors used by four of the most famous risk assessment tools (see Table 1).[19]

[16] AlgorithmWatch, *Automating Society: Taking Stock of Automated Decision-Making in the EU* (Online Report, 2019) <https://algorithmwatch.org/wp-content/uploads/2019/01/Automating_Society_Report_2019.pdf>.

[17] Bureau of Justice Assistance (n 1).

[18] Karl Hanson and Andrew Harris, 'A Structured Approach to Evaluating Change among Sexual Offenders' (2001) 13(2) *Sexual Abuse: A Journal of Research and Treatment* 105.

[19] Faye Taxman and April Pattavina, *Simulation Strategies to Reduce Recidivism Risk Need Responsivity (RNR) Modeling for the Criminal Justice System* (Springer-Verlag New York, 2013).

Table 1. The Different Dynamic Factors Used by Four of the Most Famous Risk Assessment Tools[20]

Item	Level of Service Inventory Revised (LSI–R)	Ohio Risk Assessment System (ORAS)	Correctional Offender Management Profiling for Alternative Sanctions (COMPAS)	Wisconsin Risk-Need Assessment
Education/Employment	✓	✓	✓	✓
Financial	✓	✓		✓
Family/Marital	✓	✓	✓	✓
Accommodation	✓		✓	
Leisure/Recreation	✓		✓	
Companions/Associates	✓	✓	✓	✓
Substance Use	✓	✓	✓	✓
Emotional/Personal	✓			✓
Attitudes / Orientation	✓	✓	✓	
Neighbourhood		✓	✓	
Mental Health				✓
Health/Wellness				✓
Sexual Behaviours				✓

Andrews et al identified eight risk factors named 'the central eight' that are widely accepted as the most important characteristics that need to be assessed.[21] These eight factors are as follows: a history of antisocial behaviour, patterns of antisocial personality, antisocial cognition, antisocial associates, problems with family or marriage, problems with work or school, problems with recreation or leisure and substance abuse.

Finally, in addition to risk factors, 'protective factors' also exist. According to Desmarais et al, protective factors comprise offenders' strengths that reduce the possibility of reoffending, such as excellent performance at school, good parenting skills, steady employment and community engagement.[22] However, despite these protective factors being equally important to risk factors in predicting the risk of reoffending, they are rarely included in risk assessment tools.[23] Table 2 below, created by Desmarais et al, provides a thorough overview of whether or not well-known risk assessment tools include in their assessment process protective, static or dynamic factors.[24] Protective factors are included in only 2 of the 19 tools examined (10.5%). Notably, widely used tools, such as Correctional Offender Management Profile for Alternative Sanctions

[20] Taxman and Pattavina (n 19).
[21] Don Andrews, James Bonta and Stephen Wormith, 'The Recent Past and Near Future of Risk and/or Need Assessment' (2006) 52(1) *Crime and Delinquency* 7.
[22] Sarah Desmarais, Kiersten Johnson and Jay Singh, 'Performance of Recidivism Risk Assessment Instruments in US Correctional Settings' (2016) 13(3) *Psychological Services* 206.
[23] Geoffrey L Dickens and Laura E O'Shea, 'Protective Factors in Risk Assessment Schemes for Adolescents in Mental Health and Criminal Justice Populations: A Systematic Review and Meta-Analysis of their Predictive Efficacy' (2017) 3(1) *Adolescent Research Review* 95.
[24] Desmarais, Johnson and Singh (n 22).

('COMPAS') and LSI-R, do not include protective factors even though they are equally important.

Table 2. Use of Protective, Static, or Dynamic Factors in a Selection of Famous Risk Assessment Tools[25]

	Types of Items			
Instruments	Risk	**Protective**	**Static**	**Dynamic**
COMPAS	•		•	•
IORNS	•	•	•	•
LSI-R	•		•	•
LSI-R:SV	•		•	•
ORAS-PAT	•		•	•
ORAS-CST	•		•	•
ORAS-CSST	•		•	•
ORAS-PITT	•		•	•
ORAS-RT	•		•	•
PCRA	•		•	•
RMS	•		•	•
SAQ	•		•	•
SFS74	•		•	
SFS76	•		•	
SFS81	•		•	
SPIn-W	•	•	•	•
STRONG	•		•	
WRN	•		•	•
WRN-R	•		•	•

The history of risk prediction in criminal justice traces back to the early 1900s, when correctional staff relied on their own judgments about whether someone was likely to comply with parole conditions. Modern-day assessments are more comprehensive in scope and systematic in nature. As Andrews et al note, the use of risk assessment tools to classify individuals and influence judicial decision making is considered an accepted practice in the current landscape of the criminal justice system in the US.[26]

The first generation ('1G') of risk assessment is basically a process that does not require the evaluator to follow any guidelines. This generation is also known as an 'unstructured clinical assessment' because the risk assessment is made by clinical or correctional professionals relying on their own personal training and experience.

[25] Desmarais, Johnson and Singh (n 22).
[26] Andrews, Bonta and Wormith (n 21).

The second generation (2G) of risk assessment is known as the 'actuarial method', and scholars such as Grove and Mell have characterised it as mechanical and algorithmic.[27] The actuarial method helps criminal justice professionals to relatively assess the risk posed by an individual compared to a reference group within a specific period of time.[28] Specifically, the 2G is based on the use of static risk factors from specific empirical research.[29] These factors are assigned a numerical value, and a total score is generated through an algorithm, which is then used to estimate the probability that an individual will reoffend within a specific time period.[30]

The third generation (3G) of risk assessment also uses static risk factors, but it also incorporates dynamic risk factors that are theoretically linked to reoffending. These dynamic risk factors are labelled as 'criminogenic needs'.[31] According to Blanchette and Brown, these factors are sensitive to change and their incorporation in risk assessment increases the efficiency, as it assists criminal justice officials to target and monitor risk reduction efforts.[32] Fass et al refer to the Level of Service Inventory–Revised ('LSI–R') as the most widely used risk assessment tool of this generation.[33]

Finally, the fourth generation (4G) of risk assessment builds upon the 3G of risk assessment but also focuses on case management plans. The 4G tools aim to match each individual's unique profile to an evidence-based treatment plan and to assist criminal justice authorities by combining risk management efforts with case planning.[34] To accomplish this goal, the 4G instruments seek to identify areas of success within a case management plan and areas in which intervention strategies must be modified to maximise the risk reduction potential. These instruments are informative because they document changes in specific criminogenic needs that might occur from an offender's entrance into the criminal justice system through to his or her exit from the criminal justice system.[35] According to Byrne and Pattavina, this generation of risk

[27] William Grove and Paul Meehl, 'Comparative Efficiency of Informal (Subjective, Impressionistic) and Formal (Mechanical, Algorithmic) Prediction Procedures: The Clinical-Statistical Controversy' (1996) 2(2) *Psychology, Public Policy, and Law* 293.
[28] Andrews, Bonta and Wormith (n 21).
[29] Rochelle Braaf and Clare Sneddon, 'Family Law Act Reform The Potential for Screening and Risk Assessment for Family Violence' (2007) 12(1) *Australian Domestic and Family Violence Clearinghouse* 34.
[30] Jay Singh, Martin Grann and Seena Fazel, 'A Comparative Study of Violence Risk Assessment Tools: A Systematic Review And Metaregression Analysis of 68 Studies Involving 25,980 Participants' (2011) 31(3) *Clinical Psychology Review* 7.
[31] Andrews, Bonta and Wormith (n 21).
[32] Kelley Blanchette and Shelley Brown, *The Assessment and Treatment of Women Offenders: An Integrative Perspective* (John Wiley and Sons, 1st ed, 2006).
[33] Tracy Fass et al, 'The LSI-R and the Compas Validation Data on Two Risk-Needs Tools' (2008) 35(9) *Criminal Justice and Behavior* 1095.
[34] Taxman and Pattavina (n 19).
[35] Andrews, Bonta and Wormith (n 21).

assessment tools has led practitioners to understand that an individual's risk of recidivism is the product of a combination of individual-level and community-level factors.[36]

B *Bringing Machine Learning into the Picture*

The increasing availability of very large data sets and powerful computers coupled with the new data analytics trends led to academic research on the deficits of regression analysis procedures,[37] which during the last decades have dominated the actuarial determination of risk. A number of prominent computer science scholars[38] have contended that machine learning ('ML') techniques could open the way for the future development of more effective risk assessment tools and act as a dominant statistical driver. Notably, studies related to the use of ML techniques have been present in the field of criminology for several decades now.[39]

Berk draws attention to two ML methods;[40] that is, random forest algorithms and stochastic gradient boosting. In a random forest algorithm, the predictions are based on randomly selected and merged decision trees.[41] Conversely, the stochastic gradient boosting technique groups up weak decision trees to build a stronger prediction model.[42] Both are considered black box models to some extent, as the relationship between the predictor variables and the outcome variable is not explained. Brennan and Oliver promote the use of another two

[36] James Byrne and April Pattavina, 'Next Generation Assessment Technology' (2017) 64(3) *Probation Journal* 242.
[37] Regression analysis: 'The blanket name for a family of data analysis techniques that examine relationships between variables. The techniques allow to answer questions about associations between different variables of interest. For example ... how much do education-related variables (e.g. grade point average, intrinsic motivation, classes taken, and school quality) and demographic variables (e.g. age, gender, race, and family income) affect standardized test performance? Regression allows to simultaneously look at the influence of several independent variables on a dependent variable'. Regression analysis includes several variations, such as linear, multiple linear, and nonlinear. See Geoffrey R Urland and Kevin B Raines, 'Regression Analysis' (2008) *Encyclopedia of Survey Research Methods* 710.
[38] See, eg, Adrian Raine et al, 'Neurocognitive Impairments in Boys on the Life-Course Persistent Antisocial Path.' (2005) 114(1) *Journal of Abnormal Psychology* 38; Richard Berk, *Statistical Learning From A Regression Perspective* (Springer-Verlag, 2008); Tim Brennan and Markus Breitenbach, 'The Taxonomic Challenge to General Theories of Delinquency' in Sahin and Maier (eds), *Delinquency: Causes, Reduction and Prevention* (Nova Science Publishers, 2009) 1; Anil Jain, 'Data Clustering: 50 Years Beyond K-Means' (2010) 31(8) *Pattern Recognition Letters* 651; Richard Berk and Justin Bleich, 'Statistical Procedures For Forecasting Criminal Behavior' (2013) 12(3) *Criminology and Public Policy* 513; Tim Brennan and William Oliver, 'The Emergence of Machine Learning Techniques in Criminology' (2013) 12(3) *Criminology and Public Policy* 551; Jordan Hyatt and Richard Berk, 'Machine Learning Forecasts of Risk To Inform Sentencing Decisions' (2015) 27(4) *Federal Sentencing Reporter* 222; Richard Berk, *Machine Learning Risk Assessments in Criminal Justice Settings* (Springer International Publishing, 2019).
[39] Michael J Hindelang and Joseph G Weis, 'Personality and Self-Reported Delinquency: An Application of Cluster Analysis' (1972) 10(3) *Criminology* 268; Megargee EI and MJ Bohn MJ, 'Classifying Criminal Offenders: A New System based on the MMPI' (1980) 8(3) *Psychological Assessment* 75; Tim Brennan, 'Classification: An Overview of Selected Methodological Issues' in Gottfredson and Tonry (eds), *Volume Information* (The University of Chicago Press, 2003); Philip Harris and Peter Jones, 'Differentiating Delinquent Youths For Program Planning And Evaluation' (1999) 26(4) *Criminal Justice and Behavior* 369.
[40] Richard Berk, 'Algorithmic Criminology' (2013) 2(5) *Security Informatics* 1.
[41] Celine Vens, 'Random Forest' (2013) in Werner Dubitzky Werner, Olaf Wolkenhauer, Kwang Hyun Cho, Hiroki Yokota (eds) *Encyclopedia of Systems Biology*.
[42] Jerome H Friedman, 'Stochastic Gradient Boosting' (2002) 38(4) *Computational Statistics and Data Analysis*, 367.

ML methods: supervised learning and unsupervised learning.[43] In supervised learning, the system is provided with labelled examples of input-output behaviour that enable it to 'learn' from the data what is the correct way to behave in the future. Conversely, in unsupervised learning there is no correct or incorrect answer. Instead, the system is provided with data and the goal is to learn to identify patterns based on the way data is distributed or structured.[44] In relation to the method of unsupervised learning, Brennan and Oliver do not offer clarifications regarding the existence of any related research in the criminal justice field;[45] however, they briefly note that this ML method could qualify as useful in a criminal justice risk assessment setting.[46]

It is important to note that Berk appears to have reservations as to whether superior technology (i.e., ML predictive methods) can provide the answers to the issues arising from actuarial methods.[47] Further, Brennan and Oliver note that despite the fact that ML methods are superior in dealing with large and complex data sets, they have little predictive advantage over the standard actuarial risk assessment tools. At the same time, the above-mentioned researchers and others, such as Kehl et al, suggest that policymakers and criminal justice practitioners should not ignore the potential of ML methods in forecasting the risks of reoffending.[48]

COMPAS, the most famous of the risk assessment tools in the US, was developed in 1998 and has been revised over the years. In general, COMPAS uses a multimodal approach with three data-gathering components: 1) an official records section; 2) an interview section;[49] and 3) a self-report section. Kilawee-Corsini et al recognise that over the last 10 years, the manufacturer, Northpointe, has pilot tested and incorporated ML methods into its internal prison classifications in an attempt to reliably assign new cases to their appropriate offender categories.[50] According to Northpointe, the ML methods used are random forests and support vector machines.

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[43] Brennan and Oliver (n 38).

[44] European Parliament, 'The Impact of the General Data Protection Regulation (GDPR) on Artificial Intelligence' (Report, 2020).

[45] Brennan and Oliver (n 38).

[46] Ibid.

[47] Berk (n 38).

[48] Danielle Kehl et al, 'Algorithms in the Criminal Justice System: Assessing the Use of Risk Assessments in Sentencing' (Online Report, 2017).

[49] The questionnaire of the COMPAS version used by the Department of Corrections of the State of Wisconsin is composed of 137 questions related to information ranging from a defendant's criminal history to his or her social life and thoughts. It was acquired by Julia Angwin, after her submission of a Freedom of Information ('FOI') request in the context of her research. See COMPAS, 'Sample Compas Risk Assessment' (Online Questionnaire, 2011) <https://www.documentcloud.org/documents/2702103-Sample-Risk-Assessment-COMPAS-CORE.html>; see also Angwin et al (n 2).

[50] Claire Kilawee-Corsini et al, 'Pathways to Change: A Blueprint for Developing Successful Gender-Specific Trauma-Informed Correctional Programs' (Research Paper, 2016).

An example of a European risk assessment tool that incorporates ML methods is the Harm Assessment Risk Tool ('HART') in the UK, which was created at Cambridge University in collaboration with the Durham Constabulary.[51] Notably, the HART is not used by criminal justice authorities but by police authorities, such as Durham Constabulary, the territorial police force of Durham. It assists custody officers when they are assessing the future recidivism risk of arrestees to decide whether or not the arrestees are eligible for the Constabulary's Checkpoint Programme.[52] A significant number of researchers have described in detail the technology behind the HART.[53] The HART was designed based on the random forests ML method and was built on 104,000 custody events over a five-year period (from 2008 to 2012). The tool uses 34 predictors to arrive at a forecast as to the likelihood that an arrestee will reoffend. One example of the predictors that is offered by the researchers is criminal record history. The HART classifies offenders into three risk groups: high, moderate and low. Only those arrestees forecasted as moderate risk (ie, those expected to offend but not to commit a serious crime, such as grievous bodily harm, robbery, a sexual crime or a firearm offence) are eligible for the Checkpoint Programme.

The UK also uses the Offender Assessment System ('OASys'). This risk assessment tool is used in England and Wales across prisons and probation areas. One of its goals is to assess how likely an offender is to reoffend by providing statistical indicators, such as the Offender Group Reconviction Score ('OGRS').[54] This score is founded on basic ML; however, the Ministry of Justice is considering whether more sophisticated ML methods, such as random forests, could be used to increase the number of risk factors involved. Indeed, the Ministry of Justice has admitted using neural networks since 2009 to better understand the functioning and limitations of the OASys.[55]

Finally, other fields of research could serve as useful inspiration for assessing the use of ML methods in risk prediction. Good examples of such research are related to the fields of food

[51] Jeoffrey Barnes, Sherman Lawrence and Sheena Urwin, 'Needles and Haystacks' (2018) 35(1) *Research Horizons* 32.
[52] The Checkpoint Programme 'offers eligible offenders a 4-month long contract to engage as an alternative to prosecution. The contract offers interventions to address the underlying reasons why they committed the crime to prevent them from doing it again to somebody else. Serious offences such as rape, robbery or murder will not be eligible for Checkpoint. Neither will driving offences, cases of domestic abuse or hate crime'; see Durham Constabulary, 'Checkpoint–Critical Pathways', *Durham Police* (Webpage, 2018) <https://www.durham.police.uk/Information-and-advice/Pages/Checkpoint.aspx>.
[53] Marion Oswald et al, 'Algorithmic Risk Assessment Policing Models: Lessons from the Durham HART Model and Experimental Proportionality' (2017) *SSRN Electronic Journal* 223.
[54] Michael Veale et al, 'Algorithms in the Criminal Justice System' (Online Report, 2019) <https://www.ailira.com/wp-content/uploads/2019/06/algorithms-in-criminal-justice-system-report-2019.pdf>.
[55] Ministry of Justice of the United Kingdom ('UK'), 'A Compendium of Research and Analysis on the Offender Assessment System (OASys) 2006–2009' (Online Report, 2009) <http://nomsintranet.org.uk/roh/official-documents/Debdin%20Compendium%20of%20OASys%20research.pdf>.

safety,[56] insurance, healthcare and investments.[57] Overall, ML techniques appear to play an essential part in the development of risk assessment tools in modern times. However, important reservations exist as to the actual advantages these techniques offer over standard actuarial risk assessment tools. In the following section, we will further explore the existing contradictory views on risk assessment tools.

III Assessing the Added Value of Risk Assessment Tools in European Criminal Justice Systems

A *The Contentious Nature of Risk Assessment Tools as 'Good Practice'*

The supporters of risk assessment tools present them as a solution to the issues of racial injustice and mass incarceration that have severely affected the criminal justice and prison systems in the US. However, the question arises: Are such tools really an example of 'good practice' that should also be adopted in Europe?

The extent to which the use of risk assessment tools add value remains part of an ongoing debate. Specifically, some US courts claim that risk assessment tools constitute 'significant sources of valuable information for judicial consideration'[58] while other US courts have ruled that they are 'a mindless formula' that produces 'inevitable unfairness'.[59] Further, there is a possibility that risk assessment tools could inherit the prejudices that exist in the data from previous biased judges, which would ultimately perpetuate the discrimination that they are supposed to solve.[60] Conversely, there is an alternative argument that human-driven decisions are themselves prone to exhibiting racial bias and that the data-driven approach should thus not be abandoned.[61] Finally, computer scientists remain divided on this point, as some of them appear to have

[56] Giuseppe Ru et al, 'Machine Learning Techniques Applied in Risk Assessment Related to Food Safety' (2017) 14(7) *EFSA Supporting Publications* 1.

[57] Institute and Faculty of Actuaries, 'Modelling, Analytics and Insights in Data Working Party' (Online Report, 2018). <https://www.actuaries.org.uk/system/files/field/document/Practical%20Application%20of%20Machine%20Learning%20within%20Actuarial%20Work%20Final%20%282%29_feb_2018.pdf>.

[58] *J S v State* (n 4) 2.

[59] *Cardwell v State* (n 7) 7.

[60] Christopher Barabas et al, 'An Open Letter to the Members of the Massachusetts Legislature Regarding the Adoption of Actuarial Risk Assessment Tools in the Criminal Justice System' (Open Letter, 2017) <https://cyber.harvard.edu/publications/2017/11/openletter>; Solon Barocas and Andrew Selbst, 'Big Data's Disparate Impact' (2016) 104(1) *California Law Review* 671; Angwin et al (n 2); Joanne Belknap and Kristi Holsinger, 'The Gendered Nature of Risk Factors for Delinquency' in Girls, Women, and Crime: Selected Readings (Sage Publications, 2nd ed, 2013); Patricia Van Voorhis and Lois Presser, 'Classification of Women Offenders: A National Assessment of Current Practices' (2001).

[61] Alexandra Chouldechova, 'Fair Prediction with Disparate Impact: A Study of Bias in Recidivism Prediction Instruments' (Online Report, 2017).

reservations as to whether ML methods have predictive advantages over standard actuarial risk assessment tools,[62] while others suggest that the potential of ML methods to forecast risks of reoffending should not be ignored.[63] From the above-mentioned divided positions, one thing is certain: there is no consensus that the use of risk assessment tools in the criminal justice field constitutes 'good practice'. Even if it is possible for risk assessment tools to mitigate issues related to discrimination or reduce the high rates of incarceration, they ultimately have the potential to hinder more systemic reforms in the prison system.[64]

Since the US scientific and judicial communities are divided and do not offer a clear conclusion about the benefits and drawbacks that risk assessment tools bring to the criminal justice system, one could argue that there is no self-evident reason for European communities and criminal justice authorities to adopt and introduce similar tools to their practices. Before any such adoption, European policy makers should thoroughly review existing risk assessment tools to first determine, via evidence-based practices, whether such tools could contribute to improving European criminal justice systems. This is an exercise in which other stakeholders, such as judicial authorities, victims of racial injustice, advocacy groups and civil society organisations, should actively participate.

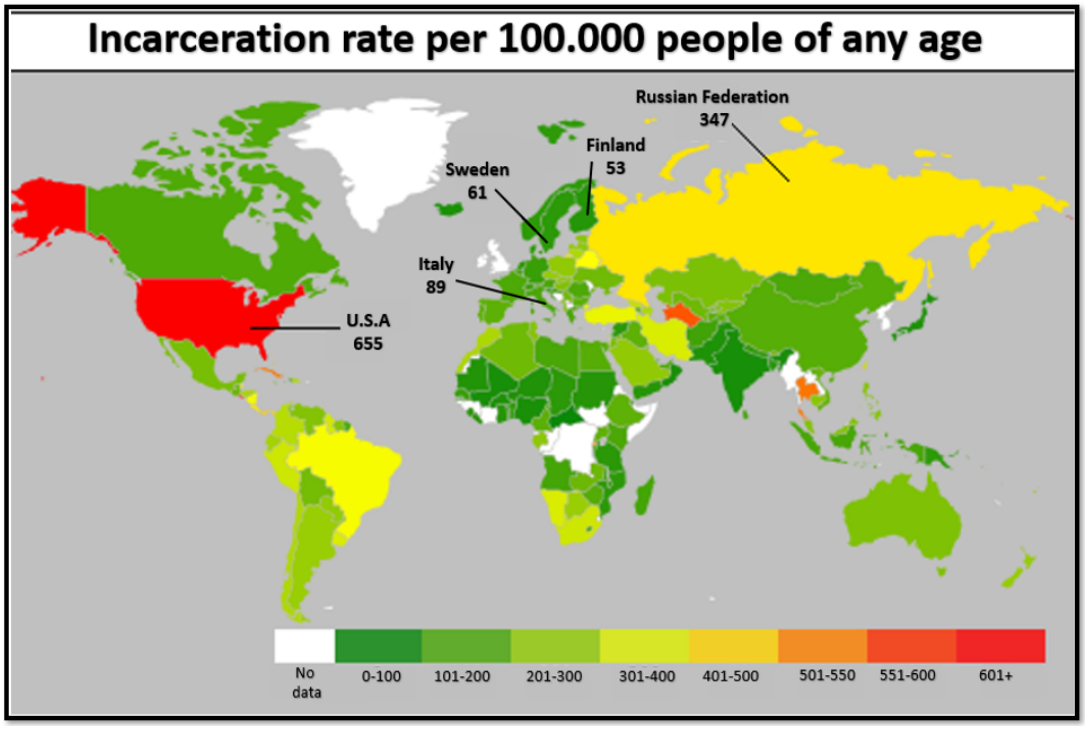
Finally, alternative measures could be implemented as safeguards against the unlawful interference of non-discrimination rights in a criminal justice context. For example, hiring more judges in lower criminal courts could reduce the workload of judges and enable them to devote more time to single cases. Further, providing additional training to judges on issues related to confirmation bias could have a positive effect on their rulings and minimise the risk of judges basing their decisions on their prejudices rather than reasonable grounds. Additionally, improving the national legal provisions on criminal court procedures such that the rulings of judges in the lower courts could be placed under scrutiny by higher courts in relation to discrimination issues could provide clear remedial routes for any individuals who were victims of such discrimination. Finally, strengthening the European civil society community could also be a useful solution, as the latter could act as a watchdog against human rights abuses in the field of criminal justice and could commence strategic litigation actions against such abuses at a national and international level within Europe.

B *Mass Incarceration and Racial Injustice in European Criminal Justice Systems*

[62] Brennan and Oliver (n 38).
[63] Kehl et al (n 48).
[64] Green (n 15).

Mass incarceration undoubtedly plagues the US criminal justice system. According to recent data provided by the World Prison Brief, the US tops the world rankings with the highest incarceration rate per 100,000 people of any age (655).[65] Conversely, all member countries of the Council of Europe and the EU have much lower incarceration rates.[66] Further, it should be emphasised that almost two thirds of the EU countries (17 of 27) have an incarceration rate below 110 people per 100,000 and are ranked at very low positions on the list.[67]

Figure 1. Incarceration Rate Per 100,000 People



Bearing in mind the low rankings of the EU and the Council of Europe's member countries, one could argue that incarceration is not a major issue in the countries of the EU and

[65] Institute for Criminal Policy Research at Birkbeck, 'University of London World Prison Brief Highest to Lowest—Prison Population Rate', *Prisonstudies.Org* (Webpage, 2020) <https://www.prisonstudies.org/highest-to-lowest/prison_population_rate?field_region_taxonomy_tid=All>.
Data is current at July 2020.

[66] Ibid. The Russian Federation is ranked the highest with an incarceration rate of 346. This number places Russia in the 24th position worldwide. The rest of the member countries of the Council of Europe that are ranked higher than member countries of the European Union (EU) are Turkey (335, 29th position), Belarus (343, 26th position), Georgia (251, 47th position), and Azerbaijan (235, 54th position). The member country of the EU with the highest rank is Lithuania (221, 65th position). These figures are current as of August 2020.

[67] Ibid. These countries are Portugal (107, 140th position), Greece (107, 140th position), Luxembourg (105, 143rd position), Romania (108, 139th position), France (97, 150th position), Austria (95, 152nd position), Belgium (95, 152nd position), Italy (89, 158th position), Cyprus (86, 160th position), Croatia (79, 168th position), Ireland (75, 172nd position), Denmark (71, 174th position), Germany (71, 174th position), Slovenia (69, 178th position), Netherlands (63, 184th position), Sweden (61, 189th position) and Finland (53, 196th position). Data for the UK are not incorporated in the visualisation because the data also includes UK overseas territories, including Anguilla, Cayman islands, Bermuda and the Virgin Islands. Thus, higher rates in these territories would falsely influence the lower rates of the UK in European grounds; that is, England and Wales (133), Scotland (132), Isle of Man (125) and Northern Ireland (77). These figures are current as of August 2020.

the Council of Europe, even if some of the countries could improve their individual situations. To conclude, if mass incarceration is one of two problems that led to the use of risk assessment tools in the US criminal justice system, it is evident from the data that the same issue does not exist at the EU and the Council of Europe level. Some of the member states of the Council of Europe, such as the Russian Federation, Belarus, Turkey, Georgia, Azerbaijan and Moldova, should adopt individual measures to lower their rates, but this clearly does not constitute an overarching European issue that must be resolved via European channels. Thus, risk assessment tools cannot be the solution to a European mass incarceration problem, as no such problem is evident based on the existing data.

In relation to racial injustice, a significant body of research suggests that this problem is plaguing the US specifically. In its report to the United Nations on racial disparities in the US Criminal Justice System, the civil society organisation, the Sentencing Project,[68] provided useful insights into racial injustice issues in pretrial and sentencing settings.[69] More precisely, in relation to pretrial detention, the report stated that African Americans are incarcerated at a rate of 3.5 times that of non-Hispanic whites.[70] In relation to sentencing, Latinos and African Americans comprise 29% of the total US population, but comprise 57% of the US prison population.[71] The imprisonment rates for adult African Americans and Latinos are 5.9 and 3.1 times the rate for white Americans, respectively. The percentages of minorities that are serving sentences are particularly high for a range of serious and non-serious crimes. For example, 56% of the people imprisoned nationwide for drug offences are African American or Latino, while 48% of those serving life sentences are African American and 15% are Latino.[72] Based on these numbers, the overrepresentation of minorities in prisons is evident and indicates that racial injustice has infiltrated the criminal justice system of the US.

In Europe, research in the field of racial inequality and injustice exists that describes the existing situation in the criminal justice systems of a few European countries, such as the UK. More precisely, according to a report into the treatment of Black, Asian and Minority Ethnic individuals in the UK criminal justice system, black people make up 12% of the prison population in Wales and England, but comprise only 3% of the overall population, and 48% of

[68] The Sentencing Project is a civil society organisation in the US focusing on issues related to reforms in sentencing policy, unjust racial disparities and practices and alternatives to incarceration. The data used by the Sentencing Project are acquired from the Bureau of Justice Statistics of the US Department of Justice.
[69] The Sentencing Project, 'Report to the United Nations on Racial Disparities in the US Criminal Justice System' (Online Report, 2018) <https://www.sentencingproject.org/publications/un-report-on-racial-disparities/>.
[70] Ibid.
[71] Ibid.
[72] Ibid.

individuals in custody aged below 18 years old are from black or other ethnic minority backgrounds.[73] Based on the Equality and Human Rights Commission of England and Wales, black men are five times more likely to be stopped by local law enforcement authorities than white men, and the prosecution and sentencing rate for people of colour is three times higher than that of for white people.[74] However, in other European countries there is a complete lack of related research. For example, in Germany, a recent initiative to conduct investigations related to racial profiling by the local police forces was cancelled.[75] However, based on an EU-wide survey on self-perceived bias conducted by the EU Agency for Fundamental Rights (FRA), 24% of 6,000 respondents of African descent stated that they had been stopped by police authorities in the last five years, and 44% of those respondents believed that such police stops were racially motivated. This perception was most prominent among respondents in countries such as Italy (70%), Austria (63%), Malta (61%) and Sweden (60%).[76]

Despite the protection against racism and discrimination offered by the applicable legal framework,[77] institutional racism remains a reality in Europe, and people of African descent or minorities, such as the Romani, still face widespread prejudice in the criminal justice field.[78] The applicable European legal framework has strict rules regarding the collection of special categories of personal data, such as data on race. Thus, racial inequality in the European criminal justice field is not documented as rigorously as in the US. Given that racial injustice cannot be perceived as a well-documented challenge within Europe, there is no justification for European countries to use racial injustice as grounds for the use of risk assessment tools in the criminal justice sector.

The significant differences in mass incarceration and racial injustice between Europe and US could affect the necessity assessment required to justify the adoption of predictive tools in the European criminal justice field. Specifically, further research needs to be undertaken to better

[73] David Lammy, 'The Lammy Review: An Independent Review into the Treatment of, and Outcomes for, Black, Asian and Minority Ethnic Individuals in the Criminal Justice System' (Online Report, 2017) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/643001/lammy-review-final-report.pdf>.

[74] Equality and Human Rights Commission, 'Healing a divided Britain: The Need for a Comprehensive Race Equality Strategy' (Online Report, 2016) <https://www.equalityhumanrights.com/en/publication-download/healing-divided-britain-need-comprehensive-race-equality-strategy>.

[75] Euractiv, 'Time for Europe to Face Uncomfortable Truths about Racial Inequality' (Web Page, 2020) <https://www.euractiv.com/section/non-discrimination/opinion/how-the-eu-is-going-about-racism-and-racial-inequality/>.

[76] European Union Agency for Fundamental Rights (FRA), 'Second European Union Minorities and Discrimination Survey – Being Black in the EU' (Online Report, 2018) <https://fra.europa.eu/sites/default/files/fra_uploads/fra-2018-being-black-in-the-eu_en.pdf>.

[77] *Convention for the Protection of Human Rights and Fundamental Freedoms*, opened for signature 4 November 1950, 213 UNTS 221 (entered into force 3 September 1953), art 14 ('*ECHR*'); Additional Protocol No. 12 to the Convention for the Protection of Human Rights and Fundamental Freedoms, opened for signature 4 November 2000, 177 ETS (entered into force 1 April 2005), art 1 ('*Additional Protocol No.12*'); *Charter of Fundamental Rights of the European Union,* proclaimed 12 December 2007, 326 OJ C 391 (entered into force 1 December 2009), art 21 ('*EU Charter*').

[78] European Union Agency for Fundamental Rights FRA (n 76).

document the current situation in Europe, thoroughly assess the underlying institutional challenges that exist, and draw insightful conclusions. The work of the FRA on minorities and discrimination is a compelling example of such research initiatives examining self-perceived bias.[79] Additionally, the FRA's research on criminal detention conditions in the EU could be extended to include in its scope issues related to racial injustice.[80]

IV US Risk Assessment Tools through the Lens of European Privacy and Data Protection Rights

In Europe, there exists an important intersection between the right to the protection of personal data, the right to privacy and the right to non-discrimination. The protection against any abuse of these rights is embedded in European[81] human rights law, such as the provisions of the European Convention on Human Rights ('ECHR'),[82] the rules of its Additional Protocol No. 12[83] and the provisions in the Treaty on the Functioning of the EU ('TFEU')[84] and the EU Charter of Fundamental Rights ('EU Charter').[85]

The right to privacy and the right to the protection of personal data are closely related, as both seek to promote and protect human dignity and autonomy. However, the right to privacy[86] prohibits any interference in the private life of an individual, while the right to the protection of personal data[87] is limited to establishing a system of checks and balances that protect individuals whenever their personal data is processed. Both rights are not absolute; rather, limitations can and do apply to the enjoyment of these rights under specific circumstances.[88] Under Council of Europe law, the right to privacy is protected by art 8 of the ECHR, while the right to the protection of personal data is not recognised as a separate right. However, in accordance with

[79] European Union Agency for Fundamental Rights (FRA), 'Second European Union Minorities and Discrimination Survey – Main Results' (Online Report, 2017) <https://fra.europa.eu/en/publication/2017/second-european-union-minorities-and-discrimination-survey-main-results>.
[80] European Union Agency for Fundamental Rights (FRA), 'Criminal Detention Conditions in the European Union: Rules and Reality' (Online Report, 2019), <https://fra.europa.eu/en/publication/2019/criminal-detention-conditions-european-union-rules-and-reality#TabPubStudies>.
[81] The use of the term 'European' in this section does not refer to the national laws of selected member states; rather, it refers to the legal provisions arising from the legislation of the EU and the Council of Europe.
[82] *ECHR* (n 77), art 8 and art 14.
[83] *Additional Protocol No.12* (n 77), art 1.
[84] *Consolidated Version of the Treaty on the Functioning of the European Union* [2012] OJ L. 326/47-326/390, art 10, art 16 and art 18.
[85] *EU Charter* (n 77), art 7, art 8 and art 21.
[86] Ibid, art 7.
[87] Ibid, art 8.
[88] Ibid, art 52.

settled case law of the European Court of Human Rights ('ECtHR') the processing of data related to the private life of an individual amounts to an interference with the right to privacy as described under art 8. [89]

The above-mentioned general framework of European human rights law is specifically expressed regarding data-processing activities in a law enforcement context with two statutory provisions: Convention 108[90] and Directive 2016/680 (also known as the Law Enforcement Directive ['LED']).[91] Both these legal statutes include provisions that aim to protect against discrimination based on unlawful grounds, such as racial or ethnic origin, political opinions, religious or philosophical beliefs or sexual orientation. These legal rules provide a set of principles and standards that risk assessment tools must comply with to be allowed to function within the European criminal justice system.

Before starting our assessment, it is important to note that the provisions of Regulation 2016/679, also known as the General Data Protection Regulation ('GDPR'),[92] are not applicable to data-processing activities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties. Thus, they will not be examined in this paper. However, it should also be noted that the GDPR's provisions are applicable to other data-processing activities of law enforcement authorities, such as administrative procedures.[93] Similarly, the provisions of the Data Protection Regulation for EU Institutions[94] also fall outside the scope of this paper. More precisely, the Court of Justice of the

[89] European Court of Human Rights, 'Factsheet—Personal Data Protection' (Online Report, 2020) <https://www.echr.coe.int/documents/fs_data_eng.pdf>.

[90] *Convention for the Protection of Individuals with Regard to the Automatic Processing of Individual Data*, opened for signature 28 January 1981, CETS No. 108 (entered into force 1 October 1985).
Convention 108 is legally binding and applies to all data processing carried out by both the private and public sectors, including data processing by the judiciary and police authorities. See European Union Agency for Fundamental Rights (FRA) et al, 'Handbook on European Data Protection Law' (2018). Even if it was drafted back in 1981, art 2 is ahead of its time and open enough to encompass algorithmic decision making of today's world, as it specifically defines 'logical and/or arithmetical operations on data' as a data-processing activity. Thus, it is understood that processing activities, such as those related to the risk assessment tools that were examined earlier in this paper, fall under this definition of data processing. Convention 108 is under a modernisation process, based on which a Protocol amending the Convention was adopted on May 2018 (CETS no. 223). The Protocol was opened for signature in October 2018. Of the signatory countries, only Bulgaria, Croatia, Poland, Serbia and Lithuania have proceeded to ratify the Protocol as of July 2020. Thus, the provisions of this protocol are not legally binding yet for the vast majority of the CoE Member States and thus were not taken into consideration in thi analysis.

[91] *Directive 2016/680* of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties and on the free movement of such data and repealing *Council Framework Decision 2008/977/JHA* [2016] OJ L 119/89.

[92] *Regulation (EU) 2016/679* of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing *Directive 95/46/EC* [2016] OJ L119/1.

[93] Paul de Hert and Vagelis Papakonstantinou, 'The New Police and Criminal Justice Data Protection Directive: A First Analysis' (2016) 7(1) New J. Eur. Crim. L. 7.

[94] *Regulation (EU) 2018/1725* of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data and repealing *Regulation (EC) No 45/2001* and *Decision No 1247/2002/EC* [2018] OJ L 295/39.

EU ('CJEU') does not hear criminal justice proceedings; rather, it interprets EU law to ensure that it is applied in a like manner across EU countries and resolves legal disputes between national governments and EU institutions.[95]

The first part of this section will focus on the challenges that arise from the use of risk assessment tools in the criminal justice field in relation to the right to privacy. The second part of this section will highlight the related concerns that emerge in relation to the right to the protection of personal data. Risk assessment tools process an immense amount of personal data related to every aspect of a defendant's personal and family life. This vast collection constitutes an important interference with the rights to privacy and data protection and could be perceived as non-compliant with the applicable legal framework.

A *Opening the Door to an Omnipresent Criminal Justice System? The Risk Assessment Tools Face the Right to Privacy*

As we examined at the beginning of this paper, the questionnaires used in the context of risk assessment tools, like COMPAS, are composed of hundreds of questions related to information ranging from a defendant's criminal history, employment and education to their personal and family life. For example, the COMPAS questionnaire asks interviewees to indicate whether they agree with statements such as 'I feel lonely' and 'The trouble with getting close to people is that they start making demands on you'. Every aspect of a defendants' life is under the microscope, from their early days at school, their juvenile years, their jobs, their neighbourhood, their parents' divorce to their own emotions, personal life, the way they see themselves and the world and the way they express themselves. Risk assessment tools process an immense amount of personal data related to 14 fields (i.e., education, financial problems, educational problems, residential instability, social adjustment, social isolation, employment, leisure, family status, leisure activities, attitudes, companions, personal values and beliefs about society).[96] Such a collection amounts to a serious interference with the right to privacy of the individuals concerned.

Any interference that is in accordance with domestic legal provisions, pursues a legitimate aim, is necessary in a democratic society and is proportionate to pursue that aim is considered

[95] European Union, 'Court of Justice of the European Union ('CJEU)' (Web Page 2020) <https://europa.eu/european-union/about-eu/institutions-bodies/court-justice_en>.

[96] Angwin et al (n 2). The questionnaire of the COMPAS version used by the Department of Corrections of the State of Wisconsin is composed of 137 questions related to information ranging from a defendant's criminal history to his or her social life and thoughts. It was acquired by Julia Angwin, after her submission of a FOI request in the context of her research. The

acceptable.[97] To establish whether a particular infringement upon the right to privacy is 'necessary in a democratic society', the state's interests in incorporating such risk assessment tools in its criminal justice system must be balanced against the defendant's right to privacy. In line with established case law of the ECtHR, the term 'necessary' is not a synonym for 'useful', 'reasonable' or 'desirable' but instead implies the existence of a 'pressing social need' for the interference with the right to privacy. It is for the state to make the primary assessment of the pressing social need on a case-by-case basis. However, its assessment remains subject to review by the ECtHR.[98] Notably, the 'pressing social need' requirement (mentioned above) appears to be related to the significance of the 'pursuit of a legitimate aim'. Thus, based on the high standards set by European human rights law, it is insufficient that the interests served by a limitation on the right to privacy are merely legitimate; they should also be 'pressing'.[99]

It is evident from the ECtHR's case law that the legislative choices underlying the proportionality assessment are of the utmost importance. Thus, any authorities that interfere with the right to privacy of individuals with their measures must achieve a fair balance between the purpose of this interference and the means used to achieve it. Thus, the added value of the interference should not outweigh the potential negative effects experienced by the individual concerned.[100]

Arguably, risk assessment tools cannot comply with the aforementioned criteria. Such tools base their assessments on a vast collection of personal data that is unrelated to the investigation. Consequently, such interference with the right to respect one's personal and private life for the purpose of assessing the risk of recidivism could not be perceived as necessary in a democratic society or as proportionate to the pursuit of that aim. Further, all the intimate questions mentioned above, which cover a wide spectrum of a defendant's life, also interfere with other human rights, such as freedom of thought, conscience and religion[101] and freedom of expression,[102] while simultaneously placing the protection of human dignity and respect at risk.

Further, European states that are interested in incorporating risk assessment tools into their criminal justice systems need to first identify the pressing social need that these tools aim to

questionnaire is available at <https://www.documentcloud.org/documents/2702103-Sample-Risk-Assessment-COMPAS-CORE.html>.

[97] *ECHR* (n 77), art 8[2]; *EU Charter* (n 77), art 52[1].

[98] European Court of Human Rights, 'Guide on Article 8 of the European Convention on Human Rights' (Online Report, 2020) <https://www.echr.coe.int/documents/guide_art_8_eng.pdf>.

[99] Janneke Gerards, 'How to Improve the Necessity Test of the European Court of Human Rights' (2013) 11(2) *International Journal of Constitutional Law* 466.

[100] European Union Agency for Fundamental Rights (FRA) et al, 'Handbook on European Data Protection Law' (2018).

[101] *ECHR* (n 77), art 9; *EU Charter* (n 77), art 10.

[102] *ECHR* (n 77), art 10; *EU Charter* (n 77), art 11.

address and second, demonstrate that the adoption of these tools will substantially alleviate this particular pressing need. However, as described in Section Three, none of these steps have been fulfilled. Notably, European countries have neither justified the pressing social need that would demand the adoption of risk assessment tools nor proved that such tools would substantially contribute to addressing this pressing social need.

Finally, as indicated earlier in this paper, even if it is possible for risk assessment tools to mitigate issues related to discrimination or reduce high rates of incarceration, such tools have the potential to hinder more systemic reforms in the prison system in the long term. There is a very serious risk in presenting these tools as 'race' neutral, independent of bias and capable of adequately predicting risks of reoffending behaviour.[103] However, there is a need to develop a European-wide understanding of the utility of such technologies in the criminal justice system and to stay alert to any potential use of risk assessment tools that does not conform to the necessity and proportionality requirements described above. As Hildebrandt emphasises, the shift from meaningful information to computation entails a shift from reason to statistics and from argumentation to simulation. However, neither lawyers nor defendants should become statisticians; rather, there is a need to develop the right set of standards and translate fundamental legal principles into the technologies that we are on the verge of embracing, while also safeguarding our ability to challenge these tools and contest their working methods.[104]

B *European Data Protection and the Concrete Challenges that Arise in the Adoption of Risk Assessment Tools*

As explained at the beginning of this section, to assess the conformity of risk assessment tools used in European criminal justice systems with the European legal framework on data protection, we will take into consideration the provisions of Convention 108 and the LED. Before starting our assessment, it is important to note that art 11 of the LED falls outside the scope of this paper. This paper regulates 'automated individual decision making' and provides that Member States should in principle prohibit any decision that is based solely on automated processing and produces an adverse legal effect concerning the data subjects or significantly affecting them. According to the then 'Article 29 Data Protection Party' (now the European Data Protection

[103] European Network Against Racism (ENAR), 'Data-Driven Policing: The hardwiring of discriminatory policing practices across Europe' (Online Report, 2019) <https://www.enar-eu.org/IMG/pdf/data-driven-profiling-web-final.pdf>.
[104] Mireille Hildebrandt, 'Law as Computation in the Era of Artificial Legal Intelligence: Speaking Law to the Power of Statistics' (2018) 68 suppl. 1 University of Toronto Law Journal 12.

Board), solely automated decision making 'refers to the ability to make decisions by technological means without human involvement in the decision process'.[105] Bearing in mind the analysis undertaken in the first section of this paper, it is understood that COMPAS and other risk assessment tools do not proceed to any action that falls under this definition. In the criminal justice setting, the decisions are always made by a human (ie, a judge) and COMPAS and other similar risk assessment tools only inform such decisions.[106] Thus, the provisions of art 11 are not applicable in relation to the risk assessment tools examined in this paper.

1 Processing of Special Categories of Personal Data and the Risk for Possible Violations

Article 6 of Convention 108 explicitly mentions that personal data 'revealing racial origin, political opinions or religious or other beliefs, as well as personal data concerning health or sexual life, may not be processed automatically unless domestic law provides appropriate safeguards'.[107] The same prohibition applies to personal data relating to 'criminal convictions'.[108] Article 10 of the LED provides the same protection.[109] It is particularly interesting that the legislators selected the verb 'reveal' in both arts 6 and 10. Thus, it is understood that the processing of information that could indirectly indicate one of the protected characteristics of a person mentioned above (proxies) could fall under this prohibition, if proven to reveal protected characteristics. Further, it is important to emphasise that the EU legislator uses the term 'strictly necessary' in art 10 of the LED. This wording is used to draw particular attention to the necessity principle when special categories of personal data are processed. Thus, the processing of special categories of personal data must apply only in so far as is strictly necessary.[110]

However, as Table 1 shows, the risk assessment tools take into consideration the place of residence (the 'neighbourhood') of a defendant in assessing the risk for reoffending.[111] It is widely known that information associated with an individual's place of residence could be used to construct proxies for race and ethnicity. Such proxies are based on the distribution of race and

[105] *Article 29 Data Protection Working Party, 'Opinion on Some Key Issues of the Law Enforcement Directive* (EU 2016/680)' (Online Report, 2017) (page 11) <https://ec.europa.eu/newsroom/article29/item-detail.cfm?item_id=610178>.
[106] 881 NW2d 749 State v Loomis (n 6).
[107] Convention for the Protection of Individuals with Regard to the Automatic Processing of Individual Data (n 98) art 6.
[108] Ibid.
[109] *Directive 2016/680* (n 91) art 10 states: 'Processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, and the processing of genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation shall be allowed only where strictly necessary, subject to appropriate safeguards for the rights and freedoms of the data subject, and only:

(a) where authorised by Union or Member State law;
(b) to protect the vital interests of the data subject or of another natural person; or
(c) where such processing relates to data which are manifestly made public by the data subject.'

[110] Article 29 Data Protection Working Party (n 105).
[111] Taxman and Pattavina (n 19).

ethnicity within a particular geographic area.[112] Further, as Table 1 also shows, as part of the risk assessment equation, risk assessment tools take into consideration information related to a defendant's (mental) health, wellness and sexual behaviour and data related to 'attitude/orientation' that could include data that reveals a defendant's philosophical beliefs. All of these categories of personal data fall under the protected characteristics for which arts 6 and 10 prohibit data-processing activities unless sufficient safeguards have been provided under national law. The 'Article 29 Data Protection Working Party' advises that (in relation to the lawfulness of the processing) arts 10 and 8 of the LED are interrelated. The processing of special categories of personal data, if not provided for by EU law, always requires a specific legal basis in national law.[113] Thus, risk assessment tools that incorporate the processing of special categories of personal data would in principle violate art 6 of Convention 108 and art 10 of the LED.

Further, even though the processing of data related to criminal convictions is subject to the prohibition of art 6 of Convention 108 and art 10 of the LED, risk assessment tools take into consideration information about the criminal history of a defendant.[114] Obviously, such information is allowed to be processed in criminal justice proceedings based on national and EU legislation.[115] However, these laws should provide specific safeguards against any abusive use of criminal records by law enforcement authorities.

2 *The Data Minimisation Principle: An Important Obstacle to the Adoption of Risk Assessment Tools*

A second important challenge to the conformity of risk assessment tools under European data protection law arises from art 5 of Convention 108 and art 4 of the LED, which provide for the principle of data minimisation. According to this principle, the data stored shall be adequate, relevant and not excessive in relation to the purposes for which they are stored. As explained above, the, questionnaires used in the context of risk assessment tools, such as COMPAS, are

[112] Consumer Financial Protection Bureau, 'Using Publicly Available Information to Proxy for Unidentified Race and Ethnicity: A Methodology and Assessment' (Online Report, 2014) <https://files.consumerfinance.gov/f/201409_cfpb_report_proxy-methodology.pdf>.

[113] Article 29 Data Protection Working Party (n 105).

[114] Northpointe, 'Practitioner's Guide to COMPAS' (Online Guide, March 19 2015) [27] <http://www.northpointeinc.com/downloads/compas/Practitioners-Guide-COMPAS-Core-_031915.pdf>.

[115] For example, national laws related to criminal procedure and European legislation allowing for the exchange of information on criminal records at EU level. These include the Council Framework Decision 2008/675 on taking account of previous convictions in new criminal proceedings against the same person [2008] OJ L 220, and Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on combating sexual abuse and sexual exploitation of children and child pornography and replacing Council Framework Decision 2004/68/JHA [2011] OJ L 335.

composed of hundreds of questions and collect an immense amount of answers which include personal data related to different aspects of a person's life.[116] The collection of such personal data for the purpose of predicting the risk of recidivism allows very precise conclusions to be drawn concerning the private lives of the defendants. This personal data does not always have a link, or at least a direct link, to the crimes that the defendants are accused of having committed. Thus, the collection of such a vast amount of personal data cannot be perceived as adequate, relevant and not excessive in relation to the purpose of predicting recidivism.

3 Describing the Mandatory Safeguards Arising from Case Law and Legal Provisions

In relation to the applicable safeguards, the ECtHR has defined in detail what types of measures are considered sufficient. In *S and Marper v the United Kingdom*, the court held that the national law should provide detailed rules related to the duration, storage, usage, access of third parties and procedures to preserve the integrity and confidentiality of the data collected by law enforcement authorities.[117] Further, there should be specific legal provisions in place describing the procedures for the destruction of data, such that sufficient guarantees against the risk of abuse and arbitrariness can be provided.[118] In the same case the ECtHR underlined that the need for these sufficient guarantees is all the greater where the protection of personal data undergoes automatic processing in a law enforcement setting.[119]

Additionally, is settled case law of the CJEU that any derogation or limitation to the rights of the protection of personal data and respect for private life must be 'strictly necessary'.[120] Notably, in relation to criminal records in particular, in the case of *M M v The United Kingdom,* the ECtHR ruled that the absence of clear and detailed statutory regulations setting out rules governing the circumstances in which data can be collected, the duration of their storage, the use to which they can be put and the circumstances in which they may be destroyed constitutes a lack

[116] Angwin et al (n 2).
The questionnaire of the COMPAS version used by the Department of Corrections of the State of Wisconsin is composed of 137 questions related to information ranging from a defendant's criminal history to his or her social life and thoughts. It was acquired by Julia Angwin, after her submission of a FOI request in the context of her research. The questionnaire is available at <https://www.documentcloud.org/documents/2702103-Sample-Risk-Assessment-COMPAS-CORE.htm>.
[117] *S and Marper v United Kingdom* [2008] ECHR 1581.
[118] Ibid para 99.
[119] Ibid para103. See also related cases such as *Kruslin v France* [1990] 12 ECHR 547, para 33–35, *Rotaru v Romania* [2000)] ECHR 192 para 57-59 and *Roman Zakharov v Russia* [2015] ECHR 1065, para 266.
[120] See for example: *Tietosuojavaltuutettu v Satakunnan Markkinapörssi Oy and Satamedia Oy* (C-73/07) [2008] ECR I-09831, [56];
Volker und Markus Schecke and Eifert v Land Hessen (C-92/09 and C-93/09) [2010] ECR I-11063, [77]; *Digital Rights Ireland Ltd v Minister for Communications, Marine and Natural Resources* (Court of Justice of the European Union, C-293/12 and C-594/12, ECLI:EU:C:2014:238, 8 April 2014), [52]; *Maximillian Schrems v Data Protection Commissioner* (Court of Justice of the European Union, C-362/14, ECLI:EU:C:2015:650, 6 October 2015) [92]; *Tele2 Sverige AB* (C-203/15 and C-698/15) [2017] OJ C 53, [96].

of sufficient safeguards that allows for the indiscriminate and open-ended collection and use of criminal record data.[121]

Finally, art 27 of the LED provides for a Data Protection Impact Assessment. Before risk assessment tools are implemented in a European criminal court, an evaluation must be undertaken to determine if the purpose of the processing (eg, to predict recidivism) could be achieved by a means less invasive to the rights of the data subject and if the processing of special categories of data poses a risk of discrimination to the data subject. Additionally, the development of such risk assessment evaluation tools constitutes a type of data-processing activity that uses new technologies and involves a high risk to the rights and freedoms of the data subjects. Consequently, art 28 of the LED, which requires the 'prior consultation of the supervisory authority', is also applicable. Thus, the national judicial authorities must consult the respective supervisory authority before the development of any risk assessment tools; otherwise, a breach of EU data protection law will be unavoidable.

V Conclusion

The supporters of risk assessment tools present this technology as the solution to the problems of racial injustice and mass incarceration that so severely affect the criminal justice and prison systems in the US. However, it is apparent that significant differences exist regarding mass incarceration and racial injustice between Europe and the US, which could affect the necessity assessment required to justify the adoption of such predictive tools in the European criminal justice field. Further, the use of risk assessment tools in the US is still part of an ongoing debate. Scientists and judicial authorities have not reached a consensus that the use of risk assessment tools in the criminal justice field constitutes good practice. Indeed, the views held on this issue are conflicting. Additionally, even if it is possible for risk assessment tools to mitigate issues related to discrimination or reduce the high rates of incarceration, they have the potential to hinder more systemic reforms in the prison system in the long term.

The use of risk assessment tools also challenges the applicable European legal provisions on data protection and privacy. The processing of special categories of personal data, which feeds the calculations of the risk assessment tools, collides with art 6 of Convention 108 and art 10 of

[121] *M M v The United Kingdom* [2012] ECHR 1906, para 199.

the LED. Additionally, this avaricious collection of personal data clashes with the principle of data minimisation provided by art 5 of Convention 108 and art 4 of the LED and interferes with the right to respect for private and family life.

Instead of shifting from reason to statistics and from argumentation to simulation in the assessment of risk, alternative measures could be adopted as safeguards against unlawful interference with the rights of non-discrimination, privacy, data protection and a fair trial in a criminal justice context. For example, hiring more judges in lower criminal courts could reduce the judges' workload. Further, providing judges with additional training on issues related to 'confirmation bias' could have a positive effect on their rulings. Finally, strengthening the European civil society community could also represent a useful solution, as the latter could act as a watchdog against human rights abuses in the field of criminal justice.

In closing, in considering this issue, it is interesting to consider the comments of Brennan, one of the creators of COMPAS. When asked to testify as a witness in a COMPAS-related case, Brennan admitted that he did not design his software to be used by the judiciary. He further stated that his focus in designing the software had not been on the punishment of offenders but on the reduction of crime via the successful correction of criminals in prison. Thus, the software was originally created to better manage prisoners within prisons and assist in their adequate rehabilitation.[122]

[122] Angwin et al (n 2).